APPENDIX L

Ecoregions of the Study Area

Ecoregions are geographic areas of similar physical, chemical, and biological characteristics organized within a hierarchical framework. Each level of the hierarchy shares important ecological attributes such as climate, geology, landform, hydrology, soils, and vegetation. Terminology for the ecoregions presented here follows that developed for the USDA Forest Service by Bailey (1995), the National Hierarchical Framework of Ecological Units (NHFEU) (Avers et al., 1994), and others. Related information using somewhat different methods of classifying broad landscapes of Wisconsin and the western Great Lakes can be found in Albert (1995) and Hole and Germain (1994).

The NHFEU comprises the following eight different scales of mapping (from largest to smallest): Domain, Division, Province, Section, Subsection, Landtype Association, Landtype, and Landtype Phase. These scales range from millions of square miles to less than 100 acres. Figure L.1 illustrates the ecoregions of the study area at four different scales of the NHFEU.

The Black River / Meadow Valley landscape is located within **Province** 222 – Eastern Broadleaf Forest (Continental). The study area is also within **Sections** 222R - Central Wisconsin Sands and 222L North Central U.S. Driftless and Escarpment. These broad ecoregional classifications are characterized by differences in climate, geomorphic process, geologic origin, drainage, and stratigraphy.

NHFEU Subsections

The next subdivision of these ecoregions shows the study area encompassing three distinct **Subsections**: the Central Wisconsin Sand Plain (222Ra), the Melrose Oak Forest and Savannah (222Lb), and the Neilsville Sandstone Plateau (222Rb). These subsections are characterized by basic differences in geomorphic process, surface geology, lithology, subregional climate, and some soil and vegetation characteristics. The subsections within the study area demonstrate unifying attributes that were useful in planning and structuring our fieldwork; these subsections are described below.

Central Wisconsin Sand Plain – Subsection 222Ra

This subsection is an extensive sand lake plain formed by Glacial Lake Wisconsin that is characterized by thick deposits of glacial outwash and lake sediments, extensive wetlands, sandstone buttes, and streams but contains no natural lakes. Soils are generally sandy, with muck, peat and small amounts of clay. Topography varies from extensive level areas to abrupt bedrock outcroppings and ridges. The Central Sands marks an area of transition between northern and southern vegetation types. Wetlands, oak forests and pine-oak barrens are common throughout the landscape and interspersed with smaller concentrations of more mesic hardwood forests and scattered hemlock relics. Dominant cover types at present include mixed pine-oak forest, tamarack swamp, sedge meadow/open bog, and plantation-grown pine.

Current land uses include forestry, agriculture on drained soils, wildlife conservation, and cranberry production. There is also a significant acreage of marginal, idle agricultural land and a high percentage of publicly owned land.

Wetlands are numerous and extensive in this subsection. Most of the wetlands here are acidic, having accumulated layers of sphagnum peat over several millennia. Open bog, muskeg, poor fen, tamarack swamp, and northern sedge meadow are common peatland communities. Other wetland types are also present, including hardwood swamp, emergent and submergent marsh, fen, alder thicket, black spruce swamp, shrub-carr, and floodplain forest. This subsection comprises the majority of the study area.

Melrose Oak Forest and Savanna – Subsection 222Lb

The Melrose Oak Forest and Savanna subsection marks the eastern edge of the unglaciated driftless area of Wisconsin. This ecoregion is characterized by highly eroded, driftless topography, relatively extensive forested landscape, with big rivers and wide river valleys. The Black River is the primary river running through the western portion of the study area. Soils are sandy and silt loams over Cambrian siltstone and sandstone. Vegetation consists of oak-forest, oak savanna, prairie, and floodplain forest. Agriculture and forestry are primary land uses. This subsection comprises a very small portion of the study area.

Neilsville Sandstone Plateau – Subsection 222Rb

The Neilsville Sandstone Plateau subsection encompasses a very limited acreage along the northern edge of the study area. The ecoregion is closely associated with the Central Sand Plains. It is characterized by a shallow irregular till surface with soils of loam, peat, and outwash sand above Cambrian sandstone. Vegetation includes more mesic hardwood forests of sugar maple-basswood and northern communities consisting of white and red pines. Oak forests and pine barrens are common. Forestry and agriculture are the dominant land uses. This subsection comprises a small portion of the study area.

More detailed information on the ecoregions of northern Wisconsin is included in the WDNR's "Northern State Forest Assessments" (1999), particularly in the reports dealing with "Regional Ecology" and "Community Restoration and Old Growth." Information is broken down by ecoregion and includes vegetative cover, wildlife, ownership, and aquatic features. Ecoregion descriptions relevant to the upper Great Lakes area can also be found in Albert (1995) and Bailey (1995).

NHFEU Landtype Associations

The study area contains 17 **Landtype Associations**, or LTAs, the next level of the hierarchy. Below are brief descriptions for the LTA's that occur within the study area. These descriptions should be considered draft, as they were still being developed at the time of the writing.

LTA 222Lb05 - Boone Valleys and Hills

The characteristic landform pattern is undulating alluvial valley fills within an eroded, dissected, bedrock-controlled landscape. Some lower-relief bedrock ridges are included. Soils are predominantly well-drained sandy loams over sandy or loamy alluvium or colluvium, over sandstone bedrock.

LTA 222Lb06 Northfield Low Hills

The characteristic landform pattern is hilly eroded, dissected, bedrock-controlled ridges with relatively wide valleys containing stream terraces and floodplains. Soils are predominantly well-drained silt loams over silty loess or loamy colluvium or residuum, over sandstone bedrock. Soils in valleys are formed in silty alluvium.

LTA 222Lb07 Trempealeau Sandstone Hills

The characteristic landform pattern is steeply dissected, with narrow valleys between bedrock-controlled sandstone ridges. Soils are predominantly well-drained silt loam over silty loess or loamy colluvium or residuum, over sandstone or dolostone bedrock. Soils in valleys are formed in silty alluvium.

LTA 222Ra04 Northwest Outlet Cranberry Bogs

The characteristic landscape pattern is broad, nearly level stream terraces formed over a glacial lake plain. Soils are predominantly very poorly drained and poorly drained mucky peats, mucks, and mucky sands over sandy alluvium or glaciolacustrine residuum. A few bedrock-controlled ridges rise above the glacial lake plain; these have excessively drained sandy soils.

LTA 222Ra07 Wisconsin River Outwash Terraces
The characteristic landscape pattern is a nearly level glacial lake plain. Soils are predominantly excessively drained sands over sandy glaciolacustrine residuum.

LTA 222Ra09 Tomah-Mauston Terraces
The characteristic landscape pattern is undulating stream terraces formed at the margin of the glacial lake plain, with protruding bedrock-controlled knolls and ridges common. Soils are predominantly somewhat poorly drained silt loams over silty alluvium or clayey glaciolacustrine materials.

LTA 222Ra11 Yellow River Floodplain and Terraces
The characteristic landscape pattern is broad, nearly level stream terraces formed over a glacial lake plain, containing a braided low-gradient river. Soils are predominantly very poorly to somewhat poorly drained mucky loamy sands or sands over sandy alluvium.

LTA 222Ra13 Yellow River Siliceous Terrace
The characteristic landscape pattern is nearly level glacial lake plain. Soils are predominantly moderately well drained sands over sandy glaciolacustrine material.

LTA 222Ra14 Glacial Lake Wisconsin Siliceous Sand Plain
The characteristic landscape pattern is nearly level glacial lake plain. Soils are predominantly very poorly and poorly drained mucky sands or sands over sandy glaciolacustrine material.

LTA 222Ra15 Lemonweir Floodplain and Terraces
The characteristic landscape pattern is nearly level stream terraces and floodplains formed over a glacial lake plain, containing a braided low-gradient river. Soils are predominantly somewhat poorly drained loamy sands over sandy to clayey stream terraces and glaciolacustrine materials.

LTA 222Ra16 Jackson-Juneau Sandstone Knolls and Terraces
The characteristic landscape pattern is rolling, eroded, bedrock-controlled knolls and ridges, surrounded by nearly level glacial lake plain and stream terraces. Soils are predominantly excessively drained sands over sandy colluvium, residuum, or alluvium; some are over sandstone bedrock.

LTA 222Ra19 Jackson Siliceous Sand Plain
The characteristic landscape pattern is broad, nearly level stream terraces formed over a glacial lake plain. A few bedrock-controlled knolls and ridges protrude. Soils are predominantly somewhat poorly and poorly drained mucky sands over sandy alluvium.

LTA 222Ra20 Black-Robinson-Harrison Terraces and Floodplains
The characteristic landscape pattern is gently sloping stream terraces and floodplains containing the area's larger rivers. A few bedrock-controlled knolls and ridges protrude. Soils are predominantly excessively drained sands over sandy alluvium; floodplain soils contain loamy sand strata and range from moderately well to poorly drained.

LTA 222Rb01 Fairchild Uplands
The characteristic landscape pattern is a rolling bedrock-controlled surface with a thin mantle of eroded glacial till. Outwash stream terraces are common in valleys. Soils on slopes and hilltops are predominantly moderately well drained loamy sands over loamy colluvium or residuum, over sandstone-shale bedrock. Soils in the valleys are predominantly sandy outwash over bedrock.

LTA 222Rb02 Spaulding Uplands
The characteristic landscape pattern is undulating erosional moraine and bedrock-controlled hills and ridges. Soils

are predominantly somewhat poorly drained loams over loamy or clayey colluvium or residuum, over sandstone-shale bedrock.

LTA 222Rb03 Pittsville Uplands

The characteristic landscape pattern is undulating erosional moraine; bedrock-controlled hills and ridges occur in places. Soils are predominantly moderately well drained drained loamy sands over loamy colluvium or residuum, over sandstone-shale bedrock.

LTA 222Rb04 Arbutus Uplands

The characteristic landscape pattern is undulating erosional moraines. Outwash stream terraces are common in valleys. Soils are predominantly somewhat poorly drained drained loamy sands over loamy colluvium or residuum, over sandstone-shale bedrock. Soils in the valleys are predominantly sandy outwash over bedrock.